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ABSTRACT

The method most organizations use in processing information to carry on their management goals are inadequate for the modern world. A convergence of theoretical and empirical work can create new ways of thinking about management. Four areas which can help to achieve better organizational procedures need concentrated study: new conceptual tools (for understanding organized complexity), more research work which enhances an understanding of the structure and process of organizations, a realization that an organization's information processing reflects its will for survival, and more extensive subject research based upon actual case studies. (CH)

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Information Processing as a Central Concept of Management

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Information Processing as a Central Concept of Management

Enough has been said about the entangled jungle which describes management and organization theory. Rather than wring our hands over the present state of affairs, let's turn toward a future view and take a positive stance.

I contend that a convergence of theoretical and empirical work will soon occur which will breathe new life into the way we think about organizations and management. The convergence will occur between four lines of effort.

First. From the work of general systems theorists, namely von Bertalanffy (3,4,5), Rapoport (27), Boulding (6), Meier (18), Buckley (7) and others, new conceptual tools for understanding organized complexity are becoming available. Some authors, for example, Katz and Kahn (15), and Johnson, Kast, and Rosenzweig (14) have recognized the import of general systems concepts and attempted to derive conceptualizations of the organization.

Probably the most pervasive work has been done by James G. Miller (19,20, 21,22,23,24), who uses general systems to integrate work from the traditional disciplines into what he calls living systems theory. Miller's living systems theory is proposed as a conceptual framework for dealing with seven levels of system; cells, organs, organisms, groups, organizations, societies and supranational systems.

From Miller's view, organizations are open systems which intake matter and energy and organize those inputs into internal processes and outputs by means of complex information processing subsystems and circuitry or by means of a complex neurology if you will. From the living systems view, organizations therefore are vast information processors -- as well as being processors of material and energy.

Thus the first segment contributing to a fresh concept of organization and management originates from general systems theory and proposes that organi-

zations are but one level of the spectrum of living systems which have evolved on this planet.

Holding the first segment to the side, let's look at the other three segments.

Second. At a plane less comprehensive than Miller's but nonetheless vital, is a growing body of theoretical and empirical work which enhances our understanding of the structure and process of organizations. To list only a few illustrations one might consider:

a) The work of Lawrence and Lorsch (16) which indicates the manner in which internal dynamics are contingent upon environmental factors.

b) The studies of Chandler (8), and Fouraker and Stopford (11) which relate the structure of command networks to organizational effectiveness.

c) The insights into the cybernetic dynamics of decisions and policy as brought out by the work of Forrester (10), or Stafford Beer (2) or Ackoff (1) or Vickers (24).

In each of the above illustrations, one common thread predominates and that is the focus on information network configuration, information processes such as decision making, or on the relationship between the organization's information processing activities and other variables of structure and process.

Third. Simultaneous with the two thrusts of development discussed above is the ongoing theoretical development which relates information processing capability with negentrophy or avoidance of entropy death.

Without relating all of the work from Maxwell to Wiener and Shannon, and since then, it seems safe to observe that there is some relationship between

form, pattern, order, organization, predictability or negentropy and the capability of a system to process information.

In the course of biological evolution, those forms which could adapt most easily tended to survive and prevail. Likewise, organizations which can stay tuned into the world around them and to their own internal needs seem most prone to survival.

Thus the third segment falls parallel to the first two. To reiterate, in point one we find Miller's living systems theory portraying organizations with vast information neurologies. In the second segment, we found a growing insight into the information processing character of organizational dynamics. In the segment just discussed, we find that systems avoid entropy death by means of information processing capability. Let's turn to our last segment.

Four. It seems nigh unbelievable but most of that which is said or written about management is prescriptive; it is armchair scholarship. Fortunately, a turn of direction is occuring. Researchers such as Mintzberg (25), Guest (13) Fiedler (9), Litt (17), Skeaff (28) and others are beginning to study actual managers in the context in which they work. One major consistant thread which emerges from observing managers in action is that they are information processors. Plan, organize and control are cumbersome and not very descriptive categories -- while on the other hand, encode, decode, channel, decide and other information processes better describe on-line managerial activity.

Given the above four segments, what projection can we reasonably make? I would make two contentions:

One: Organizations increasingly will be seen as complex "living" systems, fully dependent upon information processing capability. Tons shipped or models produced will mean less and less, while flexibility, adaptability, innovativeness,

pluralistic character, decision making finesse and other information processing oriented performances will come to mean more and more.

Two. In the context of organizations as systems, managers will be seen as controlling entropy through their performance of information processes. Thus, entropy control through information processing will become a central concept of management.

Some concluding observations to support my contentions.

The traditional management process school of plan, organize and control has consistantly failed to provide an encompassing description of the thing managed or the thing in which management occurs. By starting first with a view of the organization and then building a theory of management, a more integrated overall conceptualization is possible.

Traditional management theory has great difficulty incorporating the technological advances in information processing. In general, the computer and even the telephone have been ignored. Were management theory built in recognition of the information processing dynamics of organizations, then such artifacts and prosteses would fit comfortably.

Traditional concepts of management have had difficulty dealing with management as it varies by echelon in hierarchies or by size of organization. When an information processing view is used, it becomes easy to logically differentiate between managers at the top and at the bottom as a function of the kinds of information they process, and the span of information processes which they must perform.

The concept of the manager as an entropy controller is undeveloped. Morton (26) wrote on the idea in 1970 but otherwise the literature, with the exception of my own well-hidden work -- is barren. Nevertheless, organizations

do behave in a manner which appears negentropic and those negentropic results apparently stem from complex information processing activities. Since managers are information processors -- particularly and in the final analysis -- decision makers, thru entropy control as the essence of managerial theory seems inevitable.

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